grown in the normal Drosophila culture medium, and from 150 larvæ picked off and a large number of other eggs and larvæ, 20 male and 29 female *D. obscura* emerged to the exclusion of all other Drosophila species. Hence we concluded that the patches on elm trees form a natural breeding site for *D. obscura*.

At present the culture conditions for this species present some difficulty, but these can almost certainly be overcome. When this is accomplished we shall be in a position to undertake the examination of the genetic structure of discrete populations in relation to their known ecology.

I am indebted to Dr. O. W. Richards for the information that he had once observed what appeared to be *obscura*-like forms feeding on an exudate.

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Resistance of a Soil Nematode to Changes in Osmotic Pressure

THE results detailed below are considered to be of sufficient interest to merit early publication. An amplified account will be published in the future, when a description will be given of the species of Rhabditis which was employed. The worms were cultured in an agar broth the osmotic pressure of which was equivalent to that of about 30 m*M*. sodium chloride.

On immersing the worms in distilled water, the body swells, but the alimentary canal swells more slowly than the rest of the body. Similarly, in concentrated saline solutions, the body shrinks, the alimentary canal shrinking more slowly than the remainder. These results show that water can pass into and out of the body down a gradient of osmotic concentration, and also that the main aqueous exchanges do not occur through the gut. Further work indicated that these exchanges occur through the general body surface.

During shrinkage in concentrated solutions, vacuoles are occasionally observed between the cuticle and hypodermis. By analogy with conditions in a plasmolysed plant cell, it seems likely that the cuticle is more permeable to the substances in solution than is the hypodermis. Further experiments with cyanide solutions also suggested that the living tissues of the body wall, rather than the cuticle, are primarily responsible for controlling the permeability of the body wall.

After about fifteen minutes in distilled water, the amount of swelling of the body of the worm is reduced. This reduction is not observed with injured animals, nor when *M*/100 potassium cyanide is used instead of distilled water. These results show that there is, in distilled water, an active method of osmotic regulation whereby the size of the body is reduced. The alimentary canal probably plays some part in this regulation, since fluid is ejected from the anus during the later stages of reduction in size.

On prolonged immersion in concentrated saline solutions, the body slowly re-expands. If, towards the end of this process, the worms are transferred to distilled water, the amount of swelling which is produced is less than that obtained with animals which had not re-expanded. This suggests that, in these conditions, osmotically active material is passing out of the body. The avenue of escape could not be decided upon with certainty.

The conclusions reached contradict the general impression that free-living nematodes can withstand osmotic changes because they possess an impermeable cuticle[1], and indicate rather that this resistance is due to an active method of osmotic regulation. The conclusion that the cuticle is relatively unimportant as an insulating covering, agrees with the conclusions reached as a result of past work upon parasitic nematodes[2].

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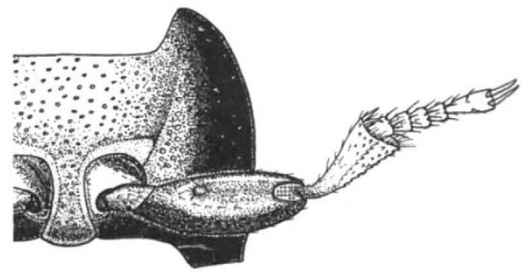
Secondary Sexual Characters of Tribolium

THE confused flour beetle, *Tribolium confusum* J. du V., and the rust-red flour beetle, *T. castaneum* Herbst, are the most abundant and destructive beetles infesting flour and other prepared cereal products. *T. confusum* is also one of the insects most commonly bred in the laboratory for experimental purposes. Hitherto it has been maintained[1,2,3] that there are no secondary sexual characters in the adult stage, and in consequence the beetles could only be sexed in the pupal stage, a procedure which is frequently very inconvenient.

I have recently found that the males of both species have on the basal fourth of the ventral side of each femur a shallow, oval pit from which arise numerous, erect, golden-yellow hairs. The females have neither the pit nor the associated brush of hairs. In *T. castaneum* (see accompanying illustration) this pit is about 0·04 mm. broad, and the hairs are nearly as long as the breadth of the pit. In living specimens of this species the presence or absence of



Tribolium castanum HERBST, MALE. VENTRAL VIEW OF LEFT FRONT LEG.

the pit and hairs can be detected with certainty with a hand lens of × 15. Specimens to be sexed should be held with the back against the index finger and the thumb nail, which needs to be moderately long, pressed gently just behind the front legs. With a little practice they can be sexed without injury. Alternatively, the insect can be picked up by touching its back with a wet brush, or, as suggested to me by Dr. J. P. Harding, it can be held in a Rousselet live box.

T. confusum has a similar but smaller pit (0·03 mm. broad) and is difficult to sex without the aid of a